

**Claims:**

1. A unit block for a core employing soft magnetic metal powder, comprising:

5           one or more powders which each have an average particle size of 175  $\mu\text{m}$  or less and which are selected from the group consisting of sendust powder, High Flux powder, MPP powder, and silicon steel powder,

          wherein the powders are compacted and heat treated to form the unit block having a length of 3 – 10 cm, a width of 1 – 5 cm, and a height of 1 – 5 cm.

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2. The unit block as set forth in claim 1, wherein the sendust powder contains 9 – 10 % Si, 4 – 8 % Al, and a balance of Fe, the High Flux powder contains 45 – 55 % Ni and a balance of Fe, the MPP powder contains 80 – 81 % Ni, 16 – 18 % Fe, and 1.5 – 2.5 % Mo, and the silicon steel powder contains 5 – 8 wt% Si and a balance of Fe.

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3. A core, which employs unit blocks made of soft magnetic metal powders and which has excellent high-current DC bias characteristics, comprising:

20           the unit blocks for the core, which are produced using one or more selected from the group consisting of sendust powder, High Flux powder, MPP powder, and silicon steel powder, and which each have a length of 3 – 10 cm, a width of 1 – 5 cm, and a height of 1 – 5 cm,

          wherein the unit blocks are attached to each other using a heat and fire resistant epoxy or polyurethane adhesive to form a single-phase reactor or a three-phase reactor.

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4. A method of producing a core, which employs unit blocks made of soft magnetic metal powders and which has excellent high current DC bias characteristics, comprising:

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          mixing one or more, each having an average particle size of 175  $\mu\text{m}$  or less, selected from the group consisting of sendust powder, High Flux powder, MPP powder, and silicon steel powder, with a solid lubricant;

          compacting a powder mixture at a pressure of 10 – 18 tons per unit area so that each of the unit blocks is 3 – 10 cm long, 1 – 5 cm wide, and 1 – 5 cm high;

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heat-treating the compacted mixture at 600 – 800 °C for 1 – 2 hours in an inert gas atmosphere to form the unit blocks each having a length of 3 – 10 cm, a width of 1 – 5 cm, and a height of 1 – 5 cm; and

- 5     attaching the unit blocks to each other using a heat and fire resistant epoxy or polyurethane adhesive to form the core.